

CAUSES OF DRY EYES AND METHODS OF PREVENTION

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Abstract: The causes of dry eyes include factors such as prolonged screen viewing, dry air, contact lens use, hormonal changes, and the effects of medications. And also recommends important measures to reduce dry eyes, such as changing the screen usage mode, blinking your eyes regularly, increasing air humidity, using artificial tear drops, and eating a healthy diet. With these recommendations, you can maintain natural eye moisture and prevent discomfort.

Keywords: dry eyes, eye health, artificial tears, screen effect, humidity, contact lenses, blinking, ophthalmologist.

Background. Dry eye disease is a multifactorial disease characterized by a vicious cycle of dysregulated ocular inflammation leading to chronic ocular dysfunction [1]. The prevalence of dry eye is increasing worldwide among all age groups, with a particularly high incidence in children and adolescents. The advent of the digital revolution and the increasing dependence on video displays (and other types of liquid crystal devices) further increase the risk of dry eye [2]. While patients with pre-existing disease continue to suffer from a chronic clinical course, the addition of new cases over time increases the overall burden of the disease. End-stage ocular surface disease resulting from chronic and progressive dry eye is extremely difficult to treat and has significant financial implications [3]. In addition to causing ocular pathology, the disease can often be associated with underlying systemic autoimmune pathologies that can be life-threatening. Patients also experience significant impairment of social mobility, pain, and general well-being, with a significant impact on quality of life comparable to that of vision loss in serious debilitating diseases such as chronic kidney disease and severe angina[4]. It is also associated with anxiety, depression, and sleep disturbances, which can have a significant economic, social, and psychological impact on the sufferer. The ongoing epidemiological transition is characterized by a shift in the composition of diseases from communicable diseases, such as infections, to non-communicable chronic diseases. Recent epidemiological studies have shown that the annual incidence and prevalence of dry eye disease will continue to increase significantly in the coming years [5].

Dry eye syndrome is one of the most common ophthalmic diseases. The official medical name for this condition is keratoconjunctivitis sicca, which is translated from

the Latin "keratoconjunctivitis", which means "dryness (inflammation) of the cornea and conjunctiva". Dry eyes, or scientifically "dry conjunctivitis", is a complex of pathological symptoms that develop due to insufficient eye moisture. The causes of this condition are a decrease in tear production or too rapid evaporation of tear fluid. Symptoms of dry eye syndrome: possible symptoms of "dry eye" syndrome develop simultaneously in both eyes. The most common symptoms that patients complain of are dry and itchy eyes after a long stay in a room with low humidity or after working at a computer and using gadgets. These symptoms are the main diagnostic criteria. In addition, people suffering from SSG may be bothered by: dryness of the cornea and a feeling of itching in the eyes, a burning sensation and "sand in the eyes", increased resistance of the eyelids when blinking after prolonged work at the computer, redness of the protein cover of the eye, increased photophobia and lacrimation, fatigue, swelling and redness of the eyelids, a feeling of a foreign body behind the eyelids, blurred vision, an increase in the time required to focus on objects. A protein or mucin layer located on the surface of the cornea and conjunctiva. Its main function is to smooth out the unevenness of the stratum corneum in order to fully feel the smoothness of the eyeball. Mucin also creates an environment for the tear film to be held on the cornea.

Aqueous layer or lacrimal fluid. Its function is to protect the eye from the ingress of foreign microorganisms and foreign bodies, as well as to enrich and nourish the cornea with oxygen.

Lipid layer. Plays an important role in protecting the eye from excessive evaporation of tear fluid, as well as from various airborne infections. All three layers in the complex maintain normal moisture of the eyeball. If for some reason at least one layer loses its ability to adequately perform its functions, a condition called dry conjunctivitis occurs.

Causes of dry eye development

Experts identify two main groups of causes of SSG:

External causes that affect the rate of evaporation of the tear film from the surface of the cornea.

Aqueous layer or lacrimal fluid. Its function is to protect the eye from the ingress of foreign microorganisms and foreign bodies, as well as to enrich and nourish the cornea with oxygen.

Internal reasons, as a result of which the secretion of moisturizing fluid is insufficient.

External reasons include prolonged work behind gadgets and monitor screens. The mechanism of rapid evaporation of tear fluid is a physiological feature of a person, in which a decrease in the frequency of blinking movements is observed during mental activity. Thus, despite the presence of a lipid layer, tear evaporation occurs faster, and a condition occurs that doctors call computer vision syndrome.

Other external factors that can cause dry eyes include:

incorrect wearing of contact lenses (lack of proper hygiene, failure to observe the replacement schedule, dry air produced by working air conditioners and heaters, frequent exposure to smoke and polluted air.

Internal causes include various diseases (endocrine, rheumatic, autoimmune and allergic), limited fluid intake, long-term use of certain medications, as well as blockage of the lacrimal gland ducts.

Dry conjunctivitis can manifest itself after surgery: for example, after laser vision correction or blepharoplasty. Such conditions are considered normal, do not require special treatment and go away on their own after a rehabilitation period.

Consequences and complications

Patients experiencing symptoms of dry eye syndrome may complain of mild discomfort. As a rule, such people have dry conjunctivitis associated with external factors. Thus, timely diagnosis and the appointment of preventive measures will help to cope with unpleasant symptoms.

However, over time, the manifestations of this disease tend to progress. Thus, a minor discomfort can cause irritability and decreased performance, and later develop into one of the most serious pathologies:

damage or erosion of the cornea (due to decreased moisture and increased friction of the eyelids), infection due to thinning of the protective layer of the eyelids, partial or complete loss of vision.

Diagnosis of the disease

To examine the inside of the eye, the patient will need to instill eye drops to dilate the pupil. After this, there is a decrease in visual acuity, which disappears on its own after 3-6 hours. After the procedure, it is recommended to wear sunglasses and rest the eyes.

During the diagnostic process, if there are indications, the doctor can simultaneously massage the eyelids and wash the lacrimal canals, which will help eliminate lacrimation. According to the results of the examination, the patient is given a conclusion sheet with an appointment. Self-diagnosis and treatment of dry eye syndrome is unacceptable due to the risk of irreversible complications and the risk of smearing the clinical picture of other serious eye pathologies that can lead to loss of vision.

Methods of treating dry eyes

When confirming the diagnosis, the patient is recommended treatment consisting of eyelid hygiene, washing the eyes with an antiseptic solution and prescribing dry eye drops. If there are concomitant diseases of the organ of vision, the doctor will recommend additional therapy. An important point in the treatment of dry eyes is to improve the microclimate in work and residential premises, hygienic wearing of contact lenses, control the balance between working time spent at the monitor or

display and rest, as well as to observe measures to prevent internal causes that cause SSG.

Levels of Prevention and Outcomes

One of the best aspects of health care reform is its focus on disease prevention. While we as clinicians aim to be successful in treating a given disease, we need to make equal progress in preventing its onset and progression. To achieve this goal, interventions must address different levels of prevention [6]. As with any disease, prevention strategies can be divided into the following five levels:

Primary prevention;

Primary prevention;

Secondary prevention;

Tertiary prevention;

Quaternary prevention. Primary prevention

This level of prevention includes measures that prevent the emergence and establishment of social, cultural, and economic patterns of life that may increase the risk of disease [6]. Thus, for primary prevention, we must focus on the general population to prevent the occurrence of risk factors. Level of prevention of dry eye disease: This figure shows a pyramid depicting prevention strategies at different levels of healthcare (arrows on the left) and target populations (arrows on the right)

Primary prevention strategies, epidemiological studies. Epidemiological studies are important in identifying the various risk factors for the development of dry eye. Identifying the underlying conditions that may be responsible for the development of the causative factors can go a long way in combating this disease.

At the primary level, many epidemiological studies have shown that age, sex, place of residence, urbanization, occupation and socioeconomic status are important risk factors for the development of dry eye [7].

With increasing urbanization and digitalization, along with the dynamic changing impact of the environment, we can expect an increase in the number of cases of dry eye in the coming years. Thus, epidemiological studies can help health institutions develop policies to develop comprehensive public health interventions to combat this emerging disease.

Lifestyle changes

Lifestyle changes such as frequent use of monitors, a sedentary lifestyle, and a diet deficient in vitamin A, vitamin D, or omega-3 fatty acids may contribute to dry eye disease [8]. Vitamin A deficiency, although preventable, continues to cause dry eye disease among children in developing countries [9]. Dryness in vitamin A deficiency is caused by poor hydration resulting from a deficiency in the lacrimal system or changes in glycolysis and a decrease in the number of goblet cells [10].

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